030-051-6356-A

FORD RECONNAISSANCE
Part I

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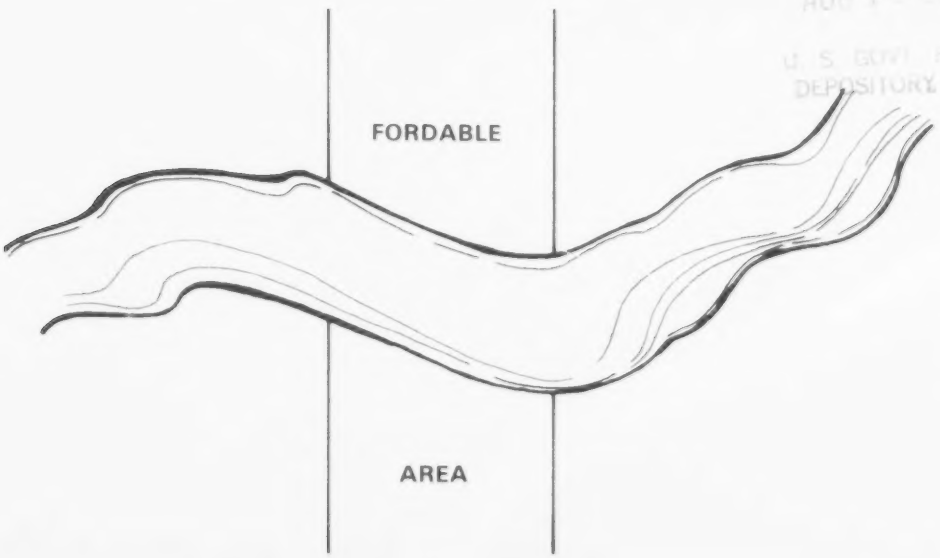
TEC LESSON 030-051-6356-A



PRODUCED BY
UNITED STATES ARMY
ENGINEER SCHOOL
FORT BELVOIR, VIRGINIA 22060

STUDENT/SUPERVISOR INSTRUCTIONS, PRETEST/POSTTEST, AND ANSWER KEY ARE CONTAINED IN THIS BOOK.

REVISED
JUNE 1985

D 101.6/2:

READ THE STUDENT/SUPERVISOR INSTRUCTIONS CAREFULLY. BE SURE YOU UNDERSTAND THEM COMPLETELY BEFORE BEGINNING THE LESSON. PLEASE DO NOT WRITE IN THIS BOOK.

The words "he," "his," and "men," when used in this publication, represent both the masculine and feminine genders, unless otherwise specifically stated.

STUDENT/SUPERVISOR INSTRUCTIONS

TYPE OF LESSON

- Ford Reconnaissance

AUDIENCE

- MOS 12B—Combat Engineer
- Skill Levels One and Two

TRAINING OBJECTIVES

Soldiers completing this lesson will be able to:

- Obtain fording site dimensions.
- Obtain fording site physical characteristics.
- Determine trafficability of the stream.

MATERIAL/EQUIPMENT/PERSONNEL REQUIRED

- Pencil and Paper
- DA Form 1251

TIME REQUIRED

- Individual: 60 minutes
- Group: 75 minutes

REFERENCES

- FM 5-34
- FM 5-36

READEX FICHE best copy available

STUDENT/SUPERVISOR INSTRUCTIONS

STUDENT INSTRUCTIONS

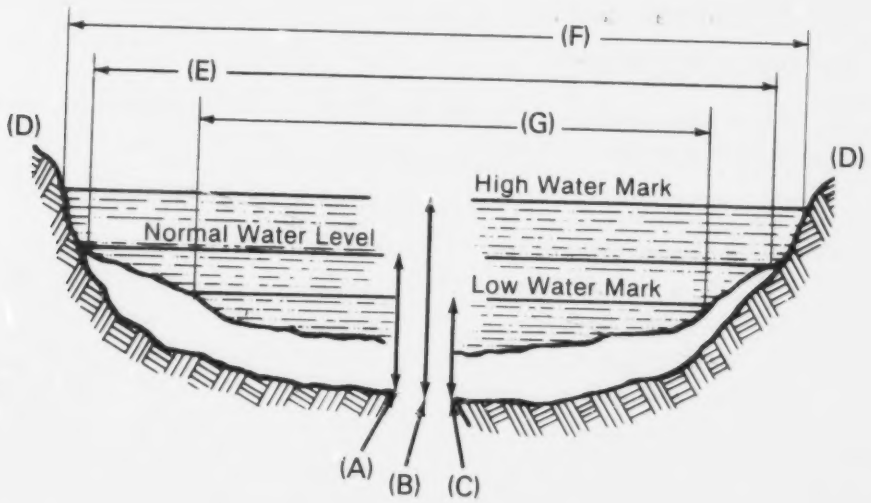
- Prerequisites: TEC Lesson 030-051-6351-F
- Take the Pretest/Posttest. If you pass, you do not have to take the lesson.
- Make sure you have the material, equipment, and personnel required to complete the lesson.
- Take the lesson.
- When you complete this lesson, take the Pretest/Posttest again. If you do not pass, take the lesson again.

SUPERVISOR INSTRUCTIONS

- Make sure students have completed the prerequisites listed in the Student Instructions.
- Administer the Pretest/Posttest to determine need for the lesson. If only one soldier is being tested, the test may be taken directly from the book, with response made on a separate sheet of paper. If more than one soldier is being tested, reproduce the test for direct use. To pass the test, a soldier must answer 100% of the items correctly.
- Make sure students have the material, equipment, and personnel required to complete the lesson.
- Administer the lesson to students who do not pass the Pretest/Posttest.
- Administer the Pretest/Posttest to students who complete the lesson. Those who do not pass must take the lesson again.

TEC LESSON 030-051-6356-A
Ford Reconnaissance
Part I

This test consists of 12 questions that cover every training objective of the lesson. These questions have a total value of 100 points. When you have completed the test, check your answers against the Pretest/Posttest Answer Key. If you do not score 100 points, you must take the lesson—or take it again if you have already taken it. If you are taking the test directly from the instruction book, write your answers on a separate sheet of paper.



Number your paper 1-7. Place the letter next to the appropriate dimension.

1. Slope of approaches _____
2. Depth of stream at normal water level _____
3. Estimated width of water at minimum stage _____
4. Width of water at normal stage _____
5. Estimated maximum water depth _____
6. Estimated width of water at maximum stage _____
7. Estimated minimum water depth _____
8. List the 3 methods you use to determine the high water widths and depths.

9. In which type of stream do you wade into the water to check the bottom?

   A. A swift current

   B. A deep river

   C. A shallow stream

10. What do you do if the stream is too deep to determine the bottom conditions due to water level?

    A: Call in a water reconnaissance team.

    B. Inform higher headquarters you were unable to determine bottom conditions due to water level.

    C. Call in an underwater team.

11. If the minimum usable width (approach width) is 39" and the slope is 1:1, what type of traffic can cross this stream?

12. If the maximum depth is 42", the minimum width is 14', and the maximum desirable slope is 2:1, what type of traffic can cross this stream?

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INTRODUCTION

As NCO of a ford reconnaissance party, you are responsible for obtaining fording site dimensions and physical characteristics to prepare DA Form 1251, the Ford Reconnaissance Report.

IN THIS LESSON YOU HAVE THREE MAIN STEPS:

1. Obtain fording site dimensions.

2. Obtain fording site physical characteristics.

3. Determine trafficability of the stream.

FORD RECONNAISSANCE PREPARATION:

You receive instructions and maps from your supervisor. Before beginning a ford reconnaissance make sure you know:

1. Location of the ford or possible fording to include bridge bypasses

2. Where, when, and to whom you turn in the report

If you need any additional information about the reconnaissance, ask your supervisor.

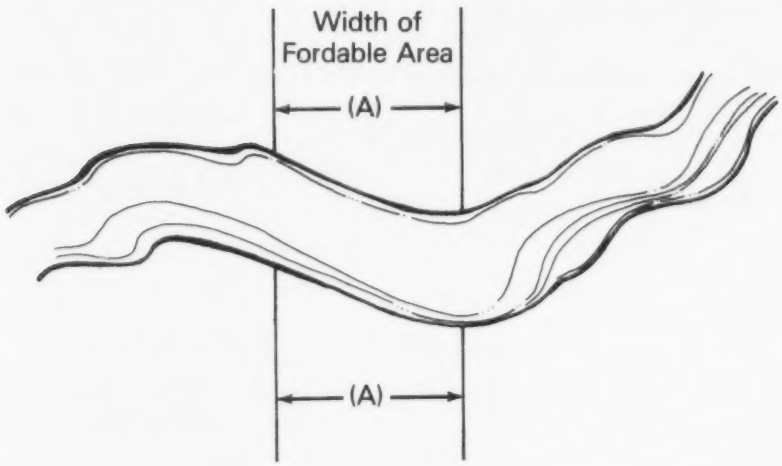
1) OBTAIN FORDING SITE DIMENSIONS

During the ford reconnaissance you obtain the following dimensions and the physical characteristics of the ford to determine the trafficability of the stream:

- Width (stream frontage of fordable area)
- Width of stream from bank to bank
- Width of water at normal, high, and low levels
- Depth of stream at normal, high, and low levels
- Slope of the approaches

1) OBTAIN FORDING SITE DIMENSIONS (Cont.)

Width of Fordable Area

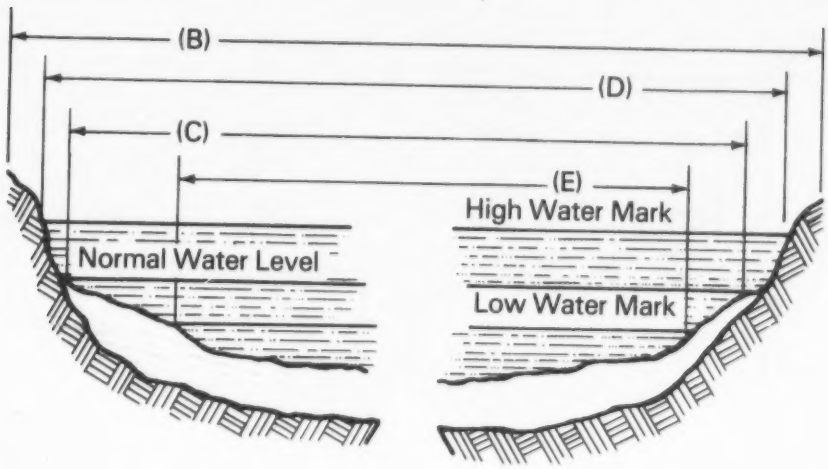


The FORDABLE AREA is the width of the area the vehicles use to enter, cross, and exit the fording site.

(A) Measure the fordable area, and record the measurement on a sheet of note paper.

1) OBTAIN FORDING SITE DIMENSIONS (Cont.)

Determine Width Dimensions



(B) Use the direct or compass methods to determine the ***width*** of the stream from ***bank to bank.***

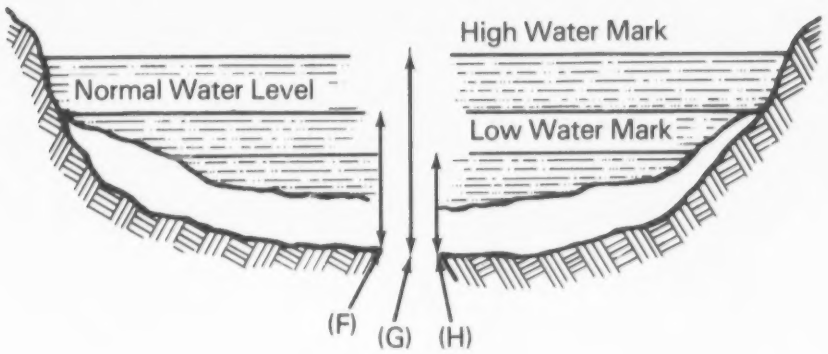
(C) Use the direct or compass methods to determine the ***width*** of the water at ***normal level.***

(D) and (E) Use the following methods to determine the ***width*** of the water at ***high and low*** water marks:

1. Observe high water marks.
2. Ask local residents.
3. Check records, if available.

1) OBTAIN FORDING SITE DIMENSIONS (Cont.)

Determine Depth Dimensions (Cont.)



Measure the depth of the water at normal, high, and low levels.

(F) Use the following methods to measure the normal depth of the stream:

1. Marked poles
2. Weighted ropes
3. Wading

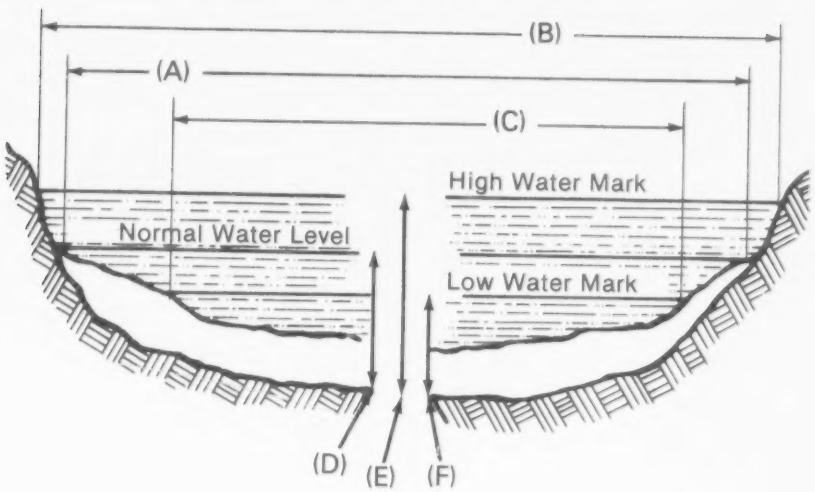
NOTE: Take depth readings every three meters.

(G) and (H) Use the following methods to determine the ***depth*** of the stream at ***high and low*** levels:

1. Observe high water marks.
2. Ask local residents.
3. Check records, if available.

PRACTICE EXERCISES:

1. List the information you must obtain before beginning the ford reconnaissance.



Match the letter with the appropriate dimensions. Refer back to the lesson if necessary.

2. Depth of stream at normal water level _____

3. Estimated minimum water depth _____

4. Width of water at normal stage _____

5. Estimated maximum water depth _____

6. Estimated width of water at maximum stage _____

7. Estimated width of water at minimum stage _____

PRACTICE EXERCISES (Cont.):

8. What three methods can you use to determine the high and low water widths and depths?

Turn the page and check your answers.

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CHECK YOUR ANSWERS:

1. Before beginning the ford reconnaissance you must obtain:
   - The location of the ford or possible fording to include bridge bypasses
   - Where, when, and to whom you turn in the report

2. Depth of stream at normal water level ___D___

3. Estimated minimum water depth ___F___

4. Width of water at normal stage ___A___

5. Estimated maximum water depth ___E___

6. Estimated width of water at maximum stage ___B___

7. Estimated width of water at minimum stage ___C___

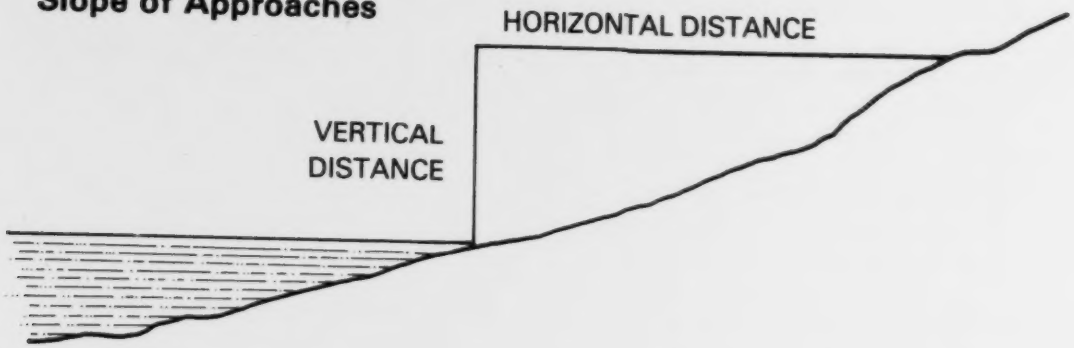
8. The three methods you use to determine the high and low water widths and depths are:

   Observe high water marks, ask local residents, and check records.

If you had no difficulty with these exercises, continue and learn how to obtain the slope of the approaches.

1) OBTAIN FORDING SITE DIMENSIONS (Cont.)

Slope of Approaches



The slope of approaches is the angle of the stream banks where the vehicles enter the water.

Use this formula to determine the ***Slope of Approaches:***

$$\text{SLOPE} = \frac{\textit{Vertical Disance}}{\textit{Horizontal Distance}} \times 100$$

Here's an example:

Vertical Distance = 2 meters

Horizontal Distance = 36 meters

$$\text{Slope} = \frac{2}{36}$$

$$\text{Slope} = 36\overline{)2.00}$$

.0555

180

200

180

200

180

20

Slope = .055 × 100 Slope = 5.6%

NOTE: Carry out division to 4 places past the decimal. When computing the percent, round off to one place ***after*** the decimal.

PRACTICE EXERCISES:

Use the following information to determine the slope of approach in percent:

9. Vertical distance = 4 meters
   Horizontal distance = 45 meters
   Slope of approach = ?

10. Vertical distance = 1 meter
    Horizontal distance = 30 meters
    Slope of approach = ?

11. Now here's a final review question. Which of the following must you determine during ford reconnaissance?

    A. Width of stream bank to bank

    B. Distance to center of stream from both banks

    C. Width of water at normal, high, and low levels

    D. Actual water depth at normal level

    E. Estimated water depth at high and low levels

    F. Slope of approaches

    G. Width (stream frontage of fordable area)

Check your answers on the following page.

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CHECK YOUR ANSWERS:

9. 8.9%

10. 3.3%

11. A
    C
    D
    E
    F
    G

You have now completed Step One. Continue and learn how to obtain fording site physical characteristics.

2) OBTAIN FORDING SITE PHYSICAL CHARACTERISTICS

In this section you will learn how to obtain fording site physical characteristics necessary for preparing the DA Form 1251, the Ford Reconnaissance Report.

During the reconnaissance you obtain information about these characteristics:

- Approaches
- Stream bottom
- Velocity
- Climatic conditions

Record information about these characteristics on a piece of note paper. You will use this information to prepare DA Form 1251.

TURN THE PAGE AND BEGIN.

2) OBTAIN FORDING SITE PHYSICAL CHARACTERISTICS (Cont.)

Approaches

Determine the ***COMPOSITION*** of the approaches. The surface materials of the approaches will be one of these:

- Concrete
- Rock
- Clay
- Bituminous
- Sand
- Gravel
- Mat or trackway
- Silt

Record the ***COMPOSITION*** of the approaches for later use.

Bottom

Determine the ***COMPOSITION*** of the stream bottom. The stream bottom will be composed of one of the following materials.

- Sand
- Gravel
- Silt
- Clay
- Rock

Obtain information about the ***STABILITY*** of the stream bottom to determine if vehicles can cross the ford. Search for quicksand, silt, or soft bottoms which may make crossing difficult or impossible. Use either of these methods when checking the stream bottom:

1. Wade across the ford if the water is shallow.
2. Inform higher headquarters if you were unable to check the stream bed composition due to high water levels.

2) OBTAIN FORDING SITE PHYSICAL CHARACTERISTICS (Cont.)

Velocity

Obtain the velocity of the current. Refer to FM 5-34 for this procedure or TEC LESSON # 030-051-6350-A.

When recording the velocity, use the following criteria.

Velocity (meters per second)	RECORD AS:
Less than 1 meter per second	SLOW
1 to 1.5 meters per second	MODERATE
More than 1.5 meters per second	SWIFT

Climatic Conditions

Obtain information about the most common conditions effecting the fordability of the stream; such as:

1. Seasonal floods
2. Excessive dry seasons
3. Freezing
4. Other extreme weather conditions

These are the main physical characteristics you obtain and record during the ford reconnaissance. Try some practice.

PRACTICE EXERCISES:

12. How do you determine the bottom condition of a shallow stream bed?

13. What do you do if the water level is too deep to determine the bottom conditions?

Using the diagram on page 21 answer the following questions:

14. How do you record a stream velocity of 2.3 meters per second?

15. How do you record a stream velocity of 1.4 meters per second?

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CHECK YOUR ANSWERS:

12. You determine the bottom condition of a shallow stream bed by wading across the stream.

13. Inform higher headquarters you were unable to determine the bottom conditions due to water level.

14. You record this stream velocity as SWIFT.

15. You record this stream velocity as MODERATE.

You have now completed the first two steps of this lesson. When you are ready, proceed to Step Three.

3) DETERMINE THE TRAFFICABILITY OF THE STREAM

When you determine the trafficability of the stream, you determine the types of vehicles that can safely cross the stream.

Use the fording site dimensions and physical characteristics you obtained in Steps 1 and 2 to make this determination.

In this section you will use the TRAFFICABILITY OF FORDS Table in FM 5-34 to answer practice exercises determining the trafficability of the stream. You use this information in preparing DA Form 1251 which you will learn how to do in the next lesson.

PRACTICE EXERCISES:

To determine the types of vehicles that can cross the stream, study the TRAFFICABILITY OF FORDS Table in FM 5-34.

NOTE: In this table the maximum slope of approaches is always based on ideal weather conditions.

Use the TRAFFICABILITY OF FORDS Table in FM 5-34 to answer the following exercises:

16. What is the shallow fordable depth of a stream for medium tanks? What about truck-drawn artillery?

17. What is the shallow fordable depth for pedestrian traffic? What about light tanks?

18. If the minimum width of the fordable area is 3.6 meters and the slope is 3:1, what type of vehicle can cross this stream?

19. If the minimum width of the fordable area is 4.2 meters, the fordable depth is 42 inches (1.05 meters), and the slope is 2:1, what type of vehicle can cross this stream?

Turn the page to check your answers.

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CHECK YOUR ANSWERS:

16. 1.05m for medium tanks
    .75m for truck-drawn artillery

17. 1 meter for pedestrian traffic
    1 meter for light tanks

18. Trucks and truck-drawn artillery can cross this stream.

19. Medium tanks can cross this stream.

If you had no difficulty with these exercises, turn the page for some more. . .

PRACTICE EXERCISES (Cont.):

Use FM 5-34 to answer the following exercises.

20. Write the maximum desirable slope for the following traffic:

    _____ foot

    _____ trucks and truck-drawn artillery

    _____ light and medium tanks

21. In the Trafficability of Fords Table on what is the maximum desirable slope based?

    A. Formula involving traffic, weather, soils, and vehicle type

    B. Ideal weather conditions

    C. Inclement weather conditions

    D. Width of stream frontage

Turn the page to check your answers.

CHECK YOUR ANSWERS:

20. 1:1 foot
    3:1 trucks and truck-drawn artillery
    2:1 light and medium tanks

21. B. The maximum slope of approaches is always based on the ideal weather conditions.

You have now completed all the practice exercises in this lesson. At this time review any sections of which you are unsure.

When you are ready, ask for the lesson test. Good luck!

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PRETEST/POSTTEST ANSWER KEY

Each of the 12 questions has a value of 8.3 points. The total possible score is 100 points. You must answer all questions correctly to pass this test.

1. Slope of approaches — D
2. Depth of stream at normal water level — A
3. Estimated width of water at minimum stage — G
4. Width of water at normal stage — E
5. Estimated maximum water depth — B
6. Estimated width of water at maximum stage — F
7. Estimated minimum water depth — C
8. The three (3) methods you use to determine the high water widths and depths are:
   Ask local inhabitants
   Check local records
   Observe the high water marks
9. C
10. B
11. Foot traffic
12. Medium tank

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